NOTES

ON THE

PRINCIPLES OF POPULATION.

MONTREAL COMPARED

WITH

LONDON, GLASGOW, AND MANCHESTER,

WITH AN EXAMINATION

OF

THE VITAL STATISTICS BY PHILIP P. CARPENTER, B.A., Ph., D.
ONE OF THE HON. SECRETARIES OF THE MONTREAL
SANITARY ASSOCIATION.

BY

ANDREW A. WATT.

PREFACE.

In the autumn of 1855, when the weekly returns of the burials in the City were attracting a good deal of attention, I sent a letter, containing the substance of the following articles, to a City newspaper and its publication was declined.

In 1859, a committee of gentlemen republished and distributed, gratis, the essay by Dr. Carpenter, which appeared in the *Canadian Naturalist and Geologist* of June that year, I again, addressed a letter on the subject of Vital Statistics to a City paper and it was rejected.

In February, 1861, I wrote a review of Dr. Carpenter's essay for the *Gazette*, but, after the appearance of three parts, it was discontinued on account of the great delay in publication.

In Feb., 1865, the *Gazette*, in an article, " London *vs.* Montreal " said, " that out of a 100,000 people resident here, nearly 1200 more died per annum than would die in the heart of London, &c., &c." After an interview with the Editors another letter was rejected.

In August last the whole of the tables were submitted to the *Witness* and their publication agreed upon. But the expense of setting up the type was so great, that a large portion of the second and nearly the whole of the third articles had to be withdrawn.

The invitation given in the City Council, on the 13th September, induced me to write the second article, in which there is introduced a portion of the matter written for the *Witness.* Mr. Lovell, who thought the first essay worth republication, willingly published the second. These facts will account, in some degree, for the very imperfect form in which the notes appear.

ANDREW A. WATT.

Montreal, 8th November, 1869.

NOTES

ON THE

PRINCIPLES OF POPULATION.

MONTREAL COMPARED WITH LONDON, GLASGOW, AND MANCHESTER.

From the Montreal Witness.

Table showing the population, number of marriages, baptisms and burials in the city of Montreal in the 14 years from January, 1855, to December, 1868.

The population is increased at 5.10 per cent. per annum ; the rate of increase between the Census years 1852 and 1861.

The number of marriages and baptisms is from the Clergy returns, and is incomplete.

The number of burials is from the Cemetery returns, and includes still-born and unbaptized children.

All the calculations are made on the population at the beginning of the year. The rates would be reduced about one-tenth per cent., if made on the population at the middle of the year.

In comparing Montreal with cities in which registration is compulsory, note that, in Montreal, baptisms only are recorded, so that to get the true birth-rate the number of still-born and unbaptized children must be added ; and that, if the rate of mortality is spoken of, the number of still-born must be deducted from the burials in Montreal, or added to the number of deaths in the city with which comparison is made.

[TABLE I.

Year. in January.	Estimated Population.	Marriages.	Baptisms.	Burials.	Marriages to Population One in	BAPTISMS.		BURIALS.	
						Rate per cent. on popul'n.	Number to a Mar'age	Rate per cent. on popul'n.	Rate per cent. on Bapt'ms
1855	67002	789	3289	2416	85	4.91	4.17	3.60	73.45
1856	70419	889	3582	2360	79	5.08	4.03	3.35	65.88
1857	74010	835	3784	2490	89	5.11	5.53	3.36	65.80
1858	77784	740	3819	2510	105	4.91	5.16	3.22	66.72
1859	81750	854	4238	2766	97	5.18	4.96	3.38	65.26
1860	85919	844	4438	3171	102	5.16	5.26	3.69	71.45
1861	90823	919	4579	3181	98	5.06	4.98	3.52	69.46
1862	94929	925	4811	3461	103	5 06	5.20	3.64	71.93
1863	99770	1103	5388	3606	90	5.40	4.88	3.61	66.93
1864	104858	†1041	†5086	4701	100	4.85	4.88	4.48	92.43
1865	110206	1097	5543	4025	100	5.03	5.05	3.65	72.61
1866	115826	1116	5158	3610	104	4.45	4.62	3.11	69.98
1867	121733	1273	5598	4465	95	4.60	4.40	3.67	79.76
1868	127941	*1085	*5160	4839	*118	*4.03	*4.75	3.78	97.77
14ys	1322470	13510	64473	47601					
Low est . .	. .	. . .	. . .	118 in 1868	4.03 in 1868	4.03 in 1856	3.11 in 1866	65.26 in 1859
High est . .	. .	. . .	. . .	79 in 1856	5.40 in 1863	5.26 in 1860	4.48 in 1864	97.77 in 1868
Appa rent av'ge.	94462	965	4605	3400	1.022 p. ct. on 1 in 98 of pop.	4.882 or 1 in 20 of pop.	4.779	3.599 or 1 in 28 of pop.	73.72

	Marriages to Popul'n One in	Births one in	Apparent D'th rate, one in	Deaths on Births per cent.
London (Metropolis) Registered 1338-1841..................	101	34	38	86.210
Glasgow, Registered, 1855-1857.......	111	25	35	71.864
London City, Registered, 1859, a healthy year...............	72	40	44	89.202

The number of Marriages in London is greatly in excess of other cities, as many persons, who reside elsewhere, go there to be married.

Before proceeding to examine Table I, it is well to state that a Census of Montreal was made in 1844, 1852, and 1861, From 1844 to 1852 the annual rate of increase was nearly 3.5 per cent. and from 1852 to 1861 it was 5.1 per cent. It has been thought proper to calculate the increase at the average rate, as it does not materially affect the general average. A calculation, made from the list of voters, and the number of houses

* August 20th—Eight Clergymen have not yet sent in their registers. In 1867 they recorded 134 Marriages and 403 Baptisms.

† In the abstract of marriages and baptisms made by the Prothonotary for 1864, there is an omission, which caused the alteration of the figures for that year.

built, might enable a closer estimate of the population to be made for some years; but, after all, probably no two persons would be agreed on the subject. During the first 7 years embraced in the table, the marriage rate was 1 in every 93 of the people; while during the remaining 7 years, it fell to 1 in 101; indicating that in the former period the population was larger than is calculated; or that, in the latter period, the people were less disposed to enter into the married state.

In the first 7 years the baptisms were 5 per cent. on the population; a decline of 1-9th in the marriage rate in the second period would give 4.45 per cent. as the proportionate rate; the returns show 4.78, or an increase of one third per cent., in the fecundity of the population, supposing the returns to have been made with equal care. The apparent increased fecundity of the people would be still further augmented were the returns completed, as supplementary returns have been made for the earlier, and are wanting for the later years. The record of the Catholic population is made with great care and punctuality, and includes 78 per cent. of the baptisms. To show how very little value can be placed on Clergy returns, it is sufficient to state that eight of the city Clergymen have not yet sent in their registers for 1868, and that in 1857 additional returns were received for the District of Montreal for the preceding 17 years!

The number of burials in the Cemetery returns exceeds the number registered by the Clergy by fully 6 per cent. on the whole number. The Cemetery returns may be said to represent the city as more unhealthy than it really is, in a degree nearly equal to that in which the record of baptisms falls short of the actual births. No deduction is made for the number coming from the country, as it is, probably, not very much larger than in other cities, and does not add one quarter per cent. to the burial rate. It is well to note, however, that in 1860 the returns show 313 from the country, or 10 per cent. of the burials. In the Census the deaths in 1860 are given as 2,038, or only two thirds of the burials according to the Cemetery returns.

The difficulties attending the subject of vital statistics must now be apparent to the reader; and as an admirable example of the absurdities written upon it, we quote from an essay by Philip P. Carpenter, B.A., Ph. D., Hon. Sec. of the Montreal Sanitary Association, which appeared in the *Canadian Naturalist and Geologist* in June, 1859.

" For the year 1851, we are in possession of tables, very carefully drawn out, both of the population and of deaths, arranged according to different ages and conditions, in the various cities and districts of Upper and Lower Canada. It is not pretended that these tables are precisely correct. Still, each of the Upper Canadian cities, where deaths at least are recorded, shows so healthy a

condition that the mortality of the country is probably not much greater than that recorded."

These remarks are confirmed by another article in the same magazine, in April 1867. Every Englishman knows that the death-rate in all England, is about 2.2 per cent., or 1 in 45 of the living, but the tables of which the essayist writes, give to Upper Canada a death-rate of only ·82 per cent., or 1 in 124; and to Lower Canada, 1.31 per cent., or 1 in 76! In England in the 4 years 1838–1841 the lowest apparent death-rate was in the South Western division, 1 in 54 (in equal numbers of males and females); and this rate was attained under the very low birth-rate of 2.967 per cent., or the second lowest in all the divisions.

Before comparing the rate of mortality in Montreal, with that which has obtained in other cities, it may be well to point out that we are not to reason like Dr. Farr, in the appendix to the Fifth Annual Report of the Registrar-General, when he says,—" Wherever from the combined effects of intemperance, dirt, bad ventilation and drainage, the mortality is greatest, there also the ratio of births to the population is the highest." *But we must say, wherever the ratio of births to the population is the highest, there also the mortality is greatest; and, the conditions being equal, will be in proportion to the birth-rate.* Commenting on Dr. Farr's observation, Charles A. Coke in " The Census of the British Empire," in 1861, p. 83, selects two groups of districts in the Metropolis. The 1st includes St. Giles and Whitechapel, showing a birth-rate of 33 in 1000 and a death-rate of 27 in the 1000. The 2nd includes London City Union, and St. James, Westminster, and shows a birth-rate of $26\frac{1}{2}$ in the 1000, and a death-rate of $22\frac{1}{2}$ in 1000. He then writes, " These combinations or comparisons show extraordinary results. In group 1 there is the greater mortality existing,—at the same time the greater increase of births. In group 2, as if in defiance of all natural law, with a decreased mortality, with more health—more vigor, we have a decrease in the number of births, and hence the scientific observations of Dr. Farr are here fully confirmed." Mr. Coke is a compiler of statistics, but does not understand them. If $26\frac{1}{2}$ births in 1000, in group 2, gives $22\frac{1}{2}$ deaths in 1000, 33 births in group 1 should give 28 deaths, so that the result is, of course, in accordance with all " Natural law." If the figures are reliable, group 1 is more healthy than group 2, as it actually produces children at a loss of 27 per 1000 instead of 28, the proportionate rate and did so on the average of 10 years 1850-1860.

The Registrar-General, Major George Graham, makes the same mistake; in the official report quoted by Mr. Coke on page 86, he says: " It is a fact well worthy of notice, that the county of Lancashire, with a population less than that of London by about 380,000

and living on an area nearly seventeen times as large, has returned almost as many deaths as the Metropolis,—the difference being only 180." The *Times* endorses the statement. The figures are not quoted, but reference to the Fourth Annual report of the Registrar-General, 1838-1841, shows that the Metropolis had to an equal number of males and females, the third lowest birth-rate and the second highest death-rate. The North Western division, Lancaster and Chester, shows the highest birth-rate and, of course, the highest death-rate. The figures are, in the Metropolis, 2.966 per cent. of births gave 2.557 per cent. of deaths, therefore, 3.626 per cent. of births in Lancashire should give 3.126 per cent. of deaths. The death-rate in Lancashire was actually 2.784 or ·342 per cent. less than the proportionate rate, because it includes town and country. Why do the two divisions now show nearly the same number of deaths? Because, mainly, of the increase of difference in the birth-rate, caused by a decline in the rate in the Metropolis, or an increase in the rate in Lancashire, or both combined; and the relatively increased migration of people to the Metropolis.

It appears from Table I. that the baptisms in Montreal average nearly 5 per cent. on the population; adding the number of still-born and unbaptized children, the birth-rate is estimated at 5.683 per cent., or nearly double the rate in London in 1841. The proportionate numbers alive at the same ages must, therefore, be greatly different in Montreal from what they were in London, especially at birth and during infancy. This is clearly shown in

TABLE II.

Table showing the number of persons alive, at the specified ages, in Montreal, and the proportionate number that would have been alive in London, Glasgow, and Manchester, supposing each city to have had the same number of Inhabitants.

AGE.	Montreal Census in 1861.	London Metropolis in 1841.	Glasgow in 1851	Manchester and Salford in 1841.
Under 1 year....................	3700*	....	2924	....
From 1 to 2 years..............	3183	....	2330	....
" 2 to 3 "	2883	....	2107	....
" 3 to 4 "	2821	....	2063	....
" 4 to 5 "	2609	....	1818	....
" 0 to 5 "	15196	10746	11242	11910
" 5 to 10 "	10363	8985	9469	9607
" 10 to 15 "	9200	8217	9149	9094
" 15 to 20 "	10890	8307	10160	9067
" 0 to 10 "	25559	19731	20711	21517
" 10 to 20 "	20090	16524	19309	18161
" 20 to 30 "	18171	18429	19711	18602
" 30 to 40 "	11044	14113	12866	14060
" 40 to 50 "	7248	9905	8589	9040
" 50 to 60 "	4476	5914	5143	4949
" 60 to 70 "	2460	3558	2739	2772
Above 70 and unknown..........	1272	....	. .	....
" 70.......................	....	2126	1232	1219
Total Population........	90323	90300	90300	90300

* Must have been 4508, according to the Register of Baptisms.

According to the census, Montreal had 1-6th of its population under 5 years of age, while London had only 1-9th ; in other words, there were in Montreal nearly one-half more chilalen under 5 years than there were in London. So that, if the cities were equally healthy, the deaths of children, in Montreal, under 5 years, must have been one-half more than in London. The number alive in Montreal under one year is clearly incorrect, as the average number of baptisms in 1860 and 1861 is 808 more than in the census, so that at least 808 should be added to the number under one year. In the *Canadian Naturalist* for April, 1867, there is a table intended to show the number of deaths under 5 years compared with 1000 deaths at all ages in Montreal, London, &c. Montreal seems to have more than one-half more deaths than London, and relying on this mode of comparison there is much said about "the slaughter of the innocents in Montreal." Will it be credited that the essayist states the London death-rate *of children under* 5 *years is below the average*, because of the large immigration of adults, and yet, having made a table which shows that the children in Montreal were 1-6th of the population, makes no allowance for the increased proportion, but actually believes that, *the death-rate of children under* 5 *years should be below the average as in London, and for the same reasons*. The numbers used by the essayist in this table are from the Census returns, and may be relatively correct, although containing only two-thirds of the burials recorded at the Cemeteries. Throughout the whole of the essay, the still-born in Montreal, nearly 8 per cent., of the burials, are included among the deaths under one year, while the rate of mortality in England is calculated on the number living, and shows the actual deaths. It must now be evident that, before we can compare the relative number of deaths under any given age, with deaths at all ages, we must know the proportionate numbers living at the specified ages in the different cities. The large proportionate number of children in Montreal, makes them constitute a large proportion of the deaths. Table I. furnishes a reply to the essayist's argument. In Montreal the *burials, including still-born, are only* 74 *per cent. on the baptisms, while in London the deaths are* 86 *per cent. on the births.* The high birth-rate is the cause of the fallacy in both arguments. But the one is as good as the other, though both are deceptive.

Table III. exhibits the *apparent* rate of mortality in Montreal, compared with London, &c. The number of still-born in Montreal is calculated at 7.866 per cent. on burials, the average rate of 6 years, according to the register of the Mount Royal Cemetery, and is certainly below the average of the whole city. The number of still-born in the other cities is calculated at the rate observed in Glasgow in 11 years from 1840. The total burials in Montreal were 3181. The deaths

at different ages in Montreal were about the numbers given, so that, presuming that the number of still-born is correct, 543 must have been buried out of the number born alive and not registered. As the rate of mortality in the British cities is calculated at the rate observed on the living, 543 must be added to their burials, as the number who died very shortly after birth, in Montreal, not appearing in the number of the living, and therefore not submitted to the death-rate in the British cities. Bear in mind that the rates for London, &c, are applied to the population of Montreal, where births are not recorded, and that in 1860, the register of the Roman Catholic Cemetery shows 2557 burials, of which 596 were still-born and under 1 month, and that the Grey Nuns' Foundling Hospital receives all children taken to it; that in 1860 it received 210 from Upper and Lower Canada and 357 from the city and the United States. Of the 567 received, 414 died within the year.

TABLE III.

Table showing the number of Burials in Montreal *under a high birth rate;* and the number that would have been recorded in London, Glasgow and Manchester, *under a comparatively low Birth-rate and at the ratio of Mortality which prevailed in them;* supposing the population, in each city to have been 90,300, and the number living at each age to have been the same as in Montreal in January, 1861.

The Table exhibits the *apparent* rate rate of Mortality; the *true rate* can only be ascertained by making the corrections for the difference in birth-rate, and the increase by immigration during the year.

AGE	Living in Montreal.	Montreal 1861, average year.		London* Metropolis, 1838-41.		Glasgow* 1851, average year		Manchester and Salford, 1838-1841.	
		Rate per cent.	Burials.	Rate per cent.	Burials.	Rate per cent.	Burials.	Rate per cent.	Burials.
Still-born	.....	.....	250	.....	210	.....	240	.....	270
Died of number not recorded as living in Montreal..........	.....	.....	543	.....	543	.....	543	.....	543
0 to 5 years........†	15196	.....	1371	9.118	1385	12.164	1848	13.171	2001
0 to 5 "	15196	.....	2164	.....	2138	.....	2631	.....	2814
5 to 10 "	10363	.....	129	1.291	134	1.278	132	1.504	160
10 to 15 "	9200	.....	65	.502	46	.731	67	.664	61
15 to 20 "	10890	....	70	.657	72	.853	92	.913	99
20 to 30 "	18174	.....	179	.912	166	1.026	186	1.192	216
30 to 40 "	11044	.....	175	1.399	154	1.504	166	1.654	183
40 to 50 "	7248	.....	128	2.041	148	2.057	149	2.339	169
50 to 60 "	4476	.....	126	3.284	147	2.908	130	3.493	156
60 to 70 "	2460	....	112	5.890	155	5.502	135	6.187	152
Above 70 and unknown, at rate of all above 70	1272	.....	133	20.?	254	15.370	195	20.?	254
Total..........	90323	.....	3181	3.780	3414	4.299	3883	4.729	4264
Living to one Burial....	.....	.....	28	.....	26	.....	24	.....	21

* See Table IV and page 29.   † See note to Table II.

In London, in the four years ending with June 1841, the birth-rate was about 2·954 and the death-rate 2·676 per cent. on the whole population. If, then, 2·954 of births gave 2·676 per cent. of deaths in London, 5·683 per cent. of births in Montreal should have given 5·148 per cent. of deaths, or 1 to every 19 of the population.

Table I, shows the burials in Montreal to have been only 1 in 28 on the average of 14 years.

How comes it then, that Montreal has been so much misrepresented? The difference between the apparent rate in Montreal and the number that would have died in London, 1 in 19, supposing its population had been increased by the same birth-rate as prevailed in Montreal, is accounted for by the difference in the rate of increase by immigration.

For example :

In January, 1856, the population of Montreal was 70,419
At the end of 10 years, the baptisms exceeded the burials of
    all born in the city and of immigrants, by .. 18·46 per c., or .. 12,997
Immigration must have added .... 46·02 per c., or .. 32,410

Increase in ten years .... 64·48 per c., or 45,407

In January 1866 the population was 115,826

The Census of 1861 shows that London gained by immigration 7·9 per cent. on its population in 1851.

These facts being known, the question is now comparatively simple. The ages of the immigrants to London and Montreal cannot be ascertained, and it is presumed they were the same. The proportionate rate of mortality in Montreal has just been estimated at .... .5·148 p. c
But Montreal gained by immigration.............. 46·02 p. c.
While London gained only 7·9 per cent.: therefore
the proportionate difference must be deducted from
Montreal.
In London the increase by births was 10·7 per cent
and by immigration 7·9. In Montreal the increase by
births was 18·46. The proportionate increase by immigration is therefore .... 13·63 p. c.

The difference .... 32·39 p. c.

Must be deducted from the rate of mortality .... 1·667

The corrected rate for Montreal is thus shown to be .... 3·481 p. c.

The corrected rate must now be applied to the average population of Montreal, in table I, 94,462, which shows that the deaths would have been 3288

The Cemetery returns of burials gave an average of........3400

From which deduct 7·866 per cent. of still born children, being the average of six years, according to the register of the Mount Royal Cemetery, and this is certainly below the number 267

The deaths are thus shown to have been 3133

So that the proportionate number who died in London on the average of the above 4 years was 155

per annum, more than died in Montreal on the average of the 14 years ending with 1868.

This result is in perfect accordance, with table 3, which shows that the rate of mortality in London would have caused 233 more deaths in Montreal in 1861 than were recorded; or 78 more than the estimate for 14 years. Table I. shows that the rate of mortality in 1861 was 3·52 or ·08 per cent less than the average; which accounts for 72 of the seeming difference between the rate experienced in London and the estimate based on the number of births in each city.

As these hurriedly written articles must now be closed, the following are submitted as legitimate conclusions : — *That the birth-rate is the certain controlling element of the death-rate; that before the relative health of different communities can be compared, the apparent rate of mortality must be corrected for the rate of increase by birth and immigration ; that, should the birth-rate in Montreal continue as it is, and the immigration fall off to the London rate, the death-rate will gradually appear to increase till it becomes* 1 *in* 19 ; *but should the birth-rate decline in proportion to the immigration, the death-rate will remain as it is ; and that, should the birth-rate decline to that of London, and the immigration continue as in the past; the rate of mortality will gradually seem to be becoming less, while in fact it may be the same.*

EXPERIENCE.

Montreal, August, 1869.
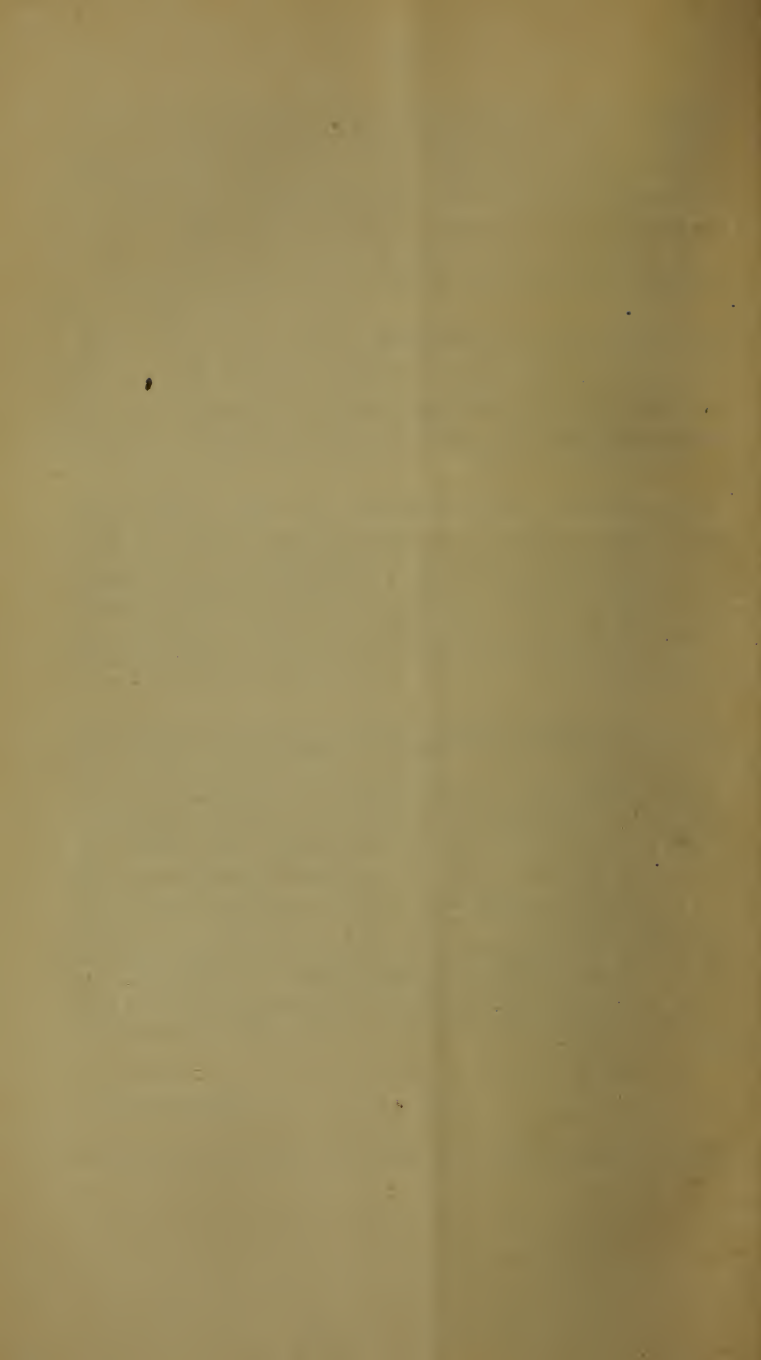
NOTES ON THE PRINCIPLES OF POPULATION.

THE VITAL STATISTICS OF MONTREAL. BY PHILIP P. CARPENTER, B.A., Ph.D.

THE YEAR BOOK OF CANADA.

In an article which appeared in the *Witness* of the 20th August there is the following sentence. "The difficulties attending the subject of vital statistics must now be apparent to the reader; and as an admirable example of the absurdities written on the subject, we quote from an essay by Philip P. Carpenter B.A., Ph.D., Hon. Secretary of the Montreal Sanitary Association, which appeared in the *Canadian Naturalist and Geologist* in June 1859."* As proof of the statement it was thought sufficient to quote a few lines from the essay in which it is affirmed that: "For the year 1851, we are in possession of tables very carefully drawn out both of the population and of deaths, arranged according to different ages and conditions, in the various cities and districts of Upper and Lower Canada, &c., &c." And to state that the rate of mortality for the two Provinces was respectively 1 in 124 and 1 in 76 of the population, according to the tables of which Dr. Carpenter wrote so favourably. It was also stated that in England the rate of mortality was 1 in 45. The reader was expected to reason thus: If in England 1 in 45 dies each year, it is not likely that in Lower Canada, only 1 in 76 dies, and it is quite impossible that the people of Upper Canada can be so healthy that only 1 in 124 dies in a year, and therefore Dr. Carpenter can not be conversant with the subject of vital statistics.

It would seem that too much had been expected from some readers, for when Alderman David called attention to the subject

* The sentence was correctly printed in the morning edition only. Without the knowledge of the writer, it was changed to; "The difficulties attending the subject of vital statistics must be apparent from an essay by Philip P. Carpenter, &c.

in the City Council, on the 13th September, the Mayor, who is President of the Sanitary Association, said that " Dr. Carpenter was a very clever man, and was usually very cautious in publishing any statements that were susceptible of doubt or uncertainty;" and Councillor G. W. Stephens, who is one of the Council of the Sanitary Association, affirmed that " Dr. Carpenter had given his figures and data for the conclusions arrived at, and they could not be disproved, and that it was useless to attempt to disbelieve the facts given in the Doctor's communications, however unpalatable they might be."

An attempt will now be made to prove that Dr. Carpenter's figures are incorrect, and that his conclusions cannot be drawn from his figures. It is hoped that they who have assisted by their subscriptions in publishing statements highly injurious to the interests of the city, will examine for themselves the correctness of the following remarks.

It is presumed that the conductors of the *Canadian Naturalist and Geologist*, and the many able men whose names appear in the list of the Council of the Sanitary Association, are not in any way responsible for the statements of Dr. Carpenter. In fact, the second Honorary Secretary would seem to be the Association, for the President at the annual meeting in April last, said: " This Association is chiefly indebted for all its progress and all its good results to the indefatigable labours and great ability of an eminent citizen, I mean Dr. Carpenter, whom Providence seems to have sent to our city to save our lives against our very wills as it were." It would be unjust to the first Honorary Secretary, A. B. Larocque, M.D., who is entirely ignored by the President, not to state, that he is the first to sign the Report which adopts all the statements of Philip P. Carpenter, B.A., Ph.D.

To complete the general survey of the position it is necessary to state, that Dr. Carpenter has published three essays, under different titles, but all relating to the vital statistics of Montreal. They appeared in June, 1859, April, 1867, and June, 1869. The subject is his hobby. It is not new to him. In 1859, he thought himself so familiar with it, that though merely on a visit in the city, he declared that " *The people of Montreal kill off thirteen hundred and sixty-five of their own flesh and blood*, every year; * * * * * * to say nothing of hundreds of lives more, which country and towns' people alike sacrifice on the altar of self-indulgence."

This is a very serious charge. But the following pen and ink sketch of Montreal, in 1867, shows that Dr. Carpenter is really in earnest.

" Liverpool is a commercial city like our own, with great natural advantages, but cursed with a neglect of the sanitary laws. It is cursed also by drink and by debauchery, to a greater extent than any other town in England. Being the most criminal as well as

the most unhealthy city in the Island, it is called the *Plague-spot on the Mersey*. Yet the Plague-spot on the St. Lawrence is *nearly twice as fatal*, in the first year of being, as the polluted Queen of the Mersey."

As a few remarks will suffice to dispose of the article on the Census in the *Year Book*, and with it the Census, which is the foundation on which Dr. Carpenter has based nearly all his comparisons, they will now be made.

The publishers of the *Year Book* of Canada, in the advertisement of the forthcoming volume intimate that " the editor-in-chief is Arthur Harvey, Esq. (Fellow of the Statistical Society of London) of the Finance Department, Ottawa," and that " no error of statistics in any of the past editions has been discovered." They probably mean that official figures have been correctly copied, but in the article, " Notes on the Census " on page 6 of the volume for 1869, it is stated that the figures showing the increase of population " are avowedly based upon the annual rate of progress of each Province between the last two Census, and many persons have written to the editor to express their doubt whether that rate has really been maintained. The subject had received much thought before any figures were published, and subsequent reflection and enquiry have confirmed the belief in their general accuracy." The number of births and deaths in each Province is given, and then, from " a table deduced by Mr. Samuel Brown F S. S., from M. Quetelet's figures, we have the following table, of the fecundity and mortality for European countries and our own." After the table it is added : " Of course these figures are considerably influenced by the emigration which leaves Europe for America, which being usually of people in the prime of life, swells the birth-rate here much sooner than the death-rate. But after making all allowances for this, and for possible inaccuracies in our Census, the influence (inference ?) remains, that the natural increase of the population of the Dominion is one of the most rapid in the world, &c."

The Census was taken in January, 1861, so that the births and deaths recorded are for the year 1860 ; but Mr. Brown has not observed this, and calculated the rates as if returned by the population of 1861. The birth-rate in Ontario is given as 3·81 and the death-rate as 0·71 (should be 0·73) per cent. If the birth-rate is calculated on the population of January, 1860, it will be about 3·97 per cent. The result is an error of 0·16 per cent. equal to 2334 births on the population in January, 1861. The number of births in Ontario may be accepted as accurate ; the number of deaths will now be shown to be incorrect. The increase of population is given as 4·34 per cent. per annum.

Without going into details the case stands thus':

In January.	Population.	Births.
1859	1282000	51200
1860	1338000	53178
1861	1396091	

The rate of mortality in England, according to the Carlisle table, (see article on Interest and Annuities in " McCulloch's Dictionary of Commerce") is not very different from the present rate, and is sufficiently correct for our purpose. The children born previous to 1859 will not be taken into account; and for convenience suppose that the above 51200 were born on 1st January, 1859. The Carlisle table shows that of 1000 born at the same time, 15·40 per cent. die during the first year, so that, the number alive in January, 1860, would be reduced to 43315. The deaths in 1860 must, therefore, have been of children in the first and second years, as follows :—

	Number Living.		Deaths
Of Children in 2nd year	43315	at 8·03 per cent	3478
Of Children Born in 1860	53178	at 15·40 "	8189
	96493	....	11667
Deduct number of deaths	11667		
	84826		
Add	1311265	....	?
Population in 1861	1396091		11667
The deaths according to the Census were			10160

So that, the deaths of children of the 1st and 2nd year, exceeded the total number recorded in the Province of Ontario by   1507 !

In fact, the deaths in Ontario must have been equal to the entire number returned by the whole population of the Dominion.

The Census of 1852 was equally as inaccurate as that of 1861, yet Dr. Carpenter wrote that it was " very carefully drawn out."

It follows then, that all statements made by Dr. Carpenter and other writers as to the relative health of different parts of the Dominion, based on the Census, have no value whatever, unless by way of showing, that they who relied on them were wholly unacquainted with the subject of vital statistics.

Let us now return to Dr. Carpenter and see how he deals with Montreal, merely noticing by the way, that he has the presumption to claim, that he was the first " to attempt to eliminate and explain the sanitary statistics of Canada." As was to be expected, the difficulty now is, not to find mistakes, but to know how to give anything like an adequate idea of their number and magnitude, and of the sort of reasoning to which he has to resort to try and defend his position.

Of the population of Montreal.—Dr. Carpenter, in 1859, wrote that he was unable to find any more accurate returns of the population than he gave, beginning with the census of 1851 (should be 1852) and ending with 1858.

In the years given in his table, the *births are stated to have exceeded the burials in the eight years by* 7494, *but the number added to the population of* 1851 *is only* 5999, *and of course, there is no allowance whatever for the increase by immigration.* Had he referred to the *Canadian Almanac* for 1854, he would have found that a Census of the city was taken in 1844, when the population was 44093, and again in 1852 when it was 57715, exhibiting an increase of nearly 3·5 per cent., per annum. Had he continued to estimate the increase at the same rate, *the population in* 1858 *would have appeared to have been* 71,000 *instead of* 63714 *as he represented,* and had he consulted the *Canada Directory* he would have found that the population for that year was estimated at 75,000. The Census of January, 1861, shows that the population in 1858 must have been about 78,000.

In 1861, the population was 90323
In 1852, the population was 57715
                                                        ———
Increase in 9 years 56·5 per cent................... 32608 or at the rate of 5·1 per cent. per annum.

In the report of the Sanitary Association for 1868, the rate of increase is stated to be only 4·7 per cent., at which rate the tables are calculated, so that there is an error of 0·4 per cent. per annum, amounting to 5853 in January, 1868.

Having ascertained what the population was, it will naturally be supposed that Dr. Carpenter would adhere to the same figures; but in 1867 he has one rate (table 4) for dealing with the deaths according to the Clergy returns, and another rate (table 7) for dealing with the Cemetery returns, so that Montreal had in 1865, a population of 103363, or 106375, and a rate of mortality of 3·61 or 3·78 per cent. according to the fancy of the reader.

He does not even carry on the different rates of increase in tables 4 and 7. In the third essay, table 4 begins with 1865, population 103363; the population of 1866 is increased by 8011, but only 5234 is added to give that of 1867. The truth is he had become bewildered; and in table 4 adopted the figures of table 7, on and after 1866. He had been trying to keep them separate for the purpose of making what he calls comparisons. The confusion may be imagined.

Of the Baptisms in Montreal—It is unnecessary to examine the number of the baptisms previous to the returns given in table 4, in the second and third essays.

When the writer called at the office of the Prothonotary, a short

time ago, and said there must be an error in the return of marriages and baptisms for 1864, he was assured that such was not the case. As soon as he had leisure, he called and examined the Registers, and found that the returns of St. Patrick's Church had been omitted when making the Abstract which is always accessible to the public. The addition to be made is 162 marriages and 1062 baptisms. The figures were corrected in the table reprinted in the *Daily News* of 15th September, but the paper was issued before some immaterial corrections were made in the body of the article. It must not be said that Dr. Carpenter should have observed this error in the returns; for although he wrote in 1859 that "The exact connection between those sanitary conditions over which man has control, and the actual number of deaths in any town or district, is no longer a matter of hypothesis," it is evident that he does not understand what he has written, because, in the tables he has prepared, he states that, in the rural districts of England the deaths were at the rate of 19 in the 1000, and that the same race in Upper Canada died at the rate of only 7·5 in the 1000. It may also be said in his favour, that although he thinks it is no longer a matter of hypothesis as to the number of men who die, that it may be a matter of hypothesis as to the number who are born.

In table 4, (second essay) the number of baptisms in 1865 is 4339, instead of 5543, but an error of 1204 in one year is of little moment. It is not a misprint. In the third essay the correct figures are given, but the previous mistake and the consequent errors in the addition of births, and the excess of births over deaths are not noticed.

The baptisms in 1868 should be 5160 not 5060, and then he should have added, that eight Clergymen, who in 1867 registered 403 baptisms had not sent in their returns. But, Dr. Carpenter, whatever may be the nature of the returns, is equally searching in his analysis and cogent in his reasoning. If the defaulting Clergymen registered 403 baptisms in 1868, then his errors amount to 1707, which with the number omitted by the Prothonotary, is 2769, or more than one fifth of the baptisms in the three years, according to Dr. Carpenter's figures.

OF THE BURIALS IN MONTREAL—It is satisfactory to be able to state that the number of burials is correct, according to the Cemetery returns given in table 7.

On page 8, of the second essay, it is said that "The returns by the Clergy of the funeral services, from which this table (4) is constructed, were the most accurate known at the time the former article was written" in 1859. It is not creditable to Dr. Carpenter's research and love of accuracy to find that, in table 7 he gives the number of interments since 1855 according to the Cemetery returns, and to have to state that, these are still entered in

the same book as in 1854, and that they were regularly published and commented on, by nearly all the newspapers of the city, since the commencement of the returns.

In consequence of Dr. Carpenter keeping two rates of population and of deaths, he made a slip which has greatly marred the thrilling effect of his statement that, in " the year of the mother's woe " 1864, the deaths of the children under 12 years, without any known special predisposing cause, "*exceeded even the abnormal number of our births by* 282 " (second essay page 20 and table 4). The figures are from the Clergy returns, but he shows in table 8, that these are 395 less than the total deaths, so that, he intended to have written, that in 1864 the deaths of children, under 12 years, exceeded the births by 577. But,

According to table 4 the births were 4024
The interments of still born and children under 12 (table 7) were.. 3536

The births exceeded the deaths of children by 488
Add error in births in abstract in Prothonotary's Office........... 1062

So that, the baptisms exceeded the number of still born and deaths
 under 12 years by ....1550.

Dr. Carpenter's figures show that, the births exceeded the deaths of children by 488, while he wrote that the deaths exceeded the births by 282, so that his error is 770, irrespective of the omission of the 1062 baptisms.

What will the citizens think of the negligence of the Sanitary Association which, in its annual report adopted 28th March, 1867, makes the following statement. " In 1864 the long accumulation of fever-food in the vast cess pool of the lower city broke out in open pestilence, and carried off 282 (577) more children than had been born that year, and that these facts are set forth and proved in a paper on the vital statistics of Montreal, published in the Canadian Naturalist." This society presented a Memorial to the Mayor, Aldermen and Councillors of the city, in which all the above manifest and gigantic untruths, as our essayist would call them, are embodied. A copy of Dr. Carpenter's essay of 1867 accompanied the Memorial.

OF THE COMPARISONS AND GENERAL STATEMENTS OF
DR. CARPENTER.

In 1859 Dr. Carpenter constructed a table in which it is shown ; that the deaths

In forty large English towns were ......26 per 1000, or 1 in 38 of pop.
In English rural districts................19   "   1 in 53   "
In Five U. Canadian towns, average 14   "   1 in 71   "
In all Upper Canada...... 8   "   1 in 125   "

And then he wrote : " Still each of the Upper Canadian cities, where deaths at least are recorded, shows so healthy a condition, that the mortality of the country is probably not much greater than that recorded." There is a limit to health and life even in Upper Canada. When perfection is well nigh reached, it is not

possible to become much better; so that, Dr. Carpenter should have written: As the Upper Canadian cities are apparently so much more healthy, than even the rural districts of England, it is certain that the country cannot be much more healthy. Probably a better idea of the absurdity of the statement will be acquired by determining the average age of the population, that could give the above rates of mortality. For convenience refer to the Royal Insurance Company's Almanac for 1869. On page 72, there is a table showing the numbers out of which one will die. The experience of seventeen English Insurance Companies, which is nearly the same as the Carlisle table, shows that a death rate

of 1 in 38 represents a whole population 58 years of age.
" 1 in 53 " " " 53 " "
" 1 in 71 " " " 48 " "
" 1 in 125 " " " 27 " "

To attain such a condition not a single birth could be allowed, because it would increase the rate of mortality; and as the deaths increase with age, such a low rate, could not by any possibility be continued, unless, all above the average age were replaced, each year, by more valuable lives.

Having in his first essay compared Montreal with the adjacent country, he continues: " Montreal was not the only city which was scourged by cholera. Vaudreuil and Lachine, in its immediate vicinity, shared the plague, &c." In 1852 Lachine had a population of 1075, and Vaudreuil 443! (See Canadian Almanac for 1853, page 79).

On the same page he discourses on immigration. " The principal way, " he says, " in which immigrants affect the returns is by increasing the population. This will probably lessen the average of later years." As the population has been increased the death-rate must appear to have been lessened, and the apparent decrease of mortality will take place at once (presuming the immigrants to be above 10 years), and become less from year to year, as their lives mature quickly with the advance of age. (See Carlisle table, or English Insurance Company's Experience in Almanac referred to). " Then he wrote " The tide of immigration affected Toronto fully as much as Montreal; yet its mortality is *considerably less than half* that of its older sister." If Toronto *appeared* to be as stated, it was chiefly in consequence of the high tide of immigration. Referring to Montreal he wrote: " As an offset to the increase of population (he meant to say, the increase of deaths from immigration;) it may be necessary to say, that, in each year but one, several religious bodies sent in no returns " of deaths. So, Dr. Carpenter thinks that the immigrants do not make the city appear more healthy. Is that the reason why he did not add even the excess of births over deaths to the population from 1851 to 1858?

The subject of immigration is very simple.   For example:

In January, 1861, the population was   90323
In   "   1852,   do   do.   57715
                                                          ———
                                                          32608

The baptisms during the 9 years were......... 32677
The deaths were (Clergy returns for 1852–1854,
     and cemetery returns for other years, Dr.
     Carpenter's figures) 23722
                                              ———
The baptisms added   15·52 per cent., or 8955
Immigration   "   40·98 per cent., or 23653
                                                ———   ———

Increase in 9 years 56·50, or 5·1 per cent. per annum........ 32608
                                                               ———

As all the births were not registered, suppose the number
of immigrants to have been 20000 in 9 years, and that their
average age was 20. Suppose they had been born in the city, how
many births would have been required to have produced the
20000?

The Carlisle table shows that only 613 are alive at the end of
     19 years, out of 1000 born at the same time, if 613 required
     1000 births, 20000 would have required.   32627
Alive at the end of 19 years   20000
                                                                      ———
So that, in 19 years, Montreal would have buried   12627

of its population, in addition to the number who died in the city.
The rate of mortality must therefore have appeared to be less
than it really was, in consequence of the immigration, because the
number of immigrants has been added to the population among
whom the deaths are divided. In other words, every country that
contributed an immigrant, bore its proportion of the loss of the
12627 deaths, and Montreal had a free gift of 20000 persons.
But the mere addition of the numbers is not the whole of the imme-
diate apparent gain.   The Carlisle table shows that the rate of
mortality in the 20th year is only 0.65 per cent. so that of the
20000 immigrants only 130 would have died in that year. Dr.
Carpenter's table shows that the population of Montreal was
dying at the rate of 3·6 per cent, therefore 20000 returned 720
deaths; or out of 3611 citizens, as many died as would have died
of 20000 immigrants, 20 years of age.

Suppose that the 20000 had been added to the population in
one year, 1852, instead of being divided among nine years, and
that they had remained unmarried; their effect on the death rate
would have been an addition of only one sixteenth; while they
added more than one third to the population.   The result would
have been, that the rate of mortality would have appeared to have
been only 2·84, instead of 3·6 per cent in 1852.

It may be consolatary for Dr. Carpenter to know, that the *Times*
of 2d February 1867, commenting on the returns of the Registrar

General says : " The death rate of the whole United Kingdom is less than that of England and Wales, a necessary consequence of the extensive immigration from Ireland and Scotland, whether into England or to other countries. A country continually deserted by its rising population will have fewer deaths, by having fewer to die, while the country, or province, or town that receives them will have that extra proportion contributing to its deaths." It is scarcely possible to believe that any person would have written such non-sense, and that it would have been published as a leader in the *Times*. The writer *must have been estimating the rate of mortality at so many per acre*, and not according to the number of persons among whom the deaths occured. As England does not lose so large a proportionate number by emigration, as the other divisions of the Kingdom, they are even more healthy, than England, than they seem to be. If the lessened death rate of the United Kingdom arose from the cause assigned, how would the emigration to England, affect the death rate of the United Kingdom, within whose bounds the people were? And, why should the same result follow from emigration, whether into England or to other countries ?

As immigration lessens the apparent rate of mortality, Montreal, should therefore, have seemed to be more healthy than cities which did not receive so large a proportion of immigrants.

The number of births must now be taken into account. Suppose that on an island in the St. Lawrence, the number of births is double that on an island in the Thames. Sooner or later all must die. So that, at the end of a generation, twice the number must have died, as certainly as if the whole race had become extinct. Therefore double the number must die every day on the island in the St. Lawrence, because they are born ; not because they are more unhealthy. *It follows therefore, that to ascertain the relative health of the inhabitants of the two islands, allowance must be made for the difference in birth-rate, and also for the difference in increase by immigration. Having done this, the remaining difference in the rate of mortality will express the relative health of the people.*

Dr. Carpenter has not observed the operation of these causes ; and till the articles by the writer appeared in the *Witness* no journal had noticed and calculated on them when writing of the apparent health of different populations. Hence it is that the *Pall Mall Gazette* in February 1866, having quoted the returns of the Registrar General, showing that the deaths for the year had been as follows ; for every 1000 persons living in Birmingham 24, London 26, Edinburgh 27, Glasgow 30, Manchester 32, and Liverpool 42, asks " what that really means is worth consideration even by the most cursory reader. If life is worth anything would it not be well to account" for the difference.

This is not the place to enter into an examination of the returns,

but that they do not express the relative health of the cities, must be evident from a moment's consideration of what has been stated as to the effect of immigration, of the birth-rate, and of the known rates of increase of the different cities. According to the Census of 1841, the increase in the previous ten years was in Liverpool 39, Glasgow 36, Manchester 30, Birmingham 29, London 18, and Edinburgh only 3 per cent.* The birth rate was also very different; in London it is now less than 3, and in Glasgow it is more than 4 per cent. The fact that life is governed by laws, equally as certain as those which govern the atmosphere, is enough to enable us to say that the returns do not express the truth. What would be thought if the Board of Trade were to telegraph, that the barometer indicated at Birmingham, 30 inches, London 28, Glasgow 24, and Liverpool 17? *When the Meteorologist corrects and reduces the indications of the barometer to a temperature of* 32° *at sea level, he performs an operation analogous to what must be done with the observations of the Registrar General, to render them intelligible and of any value.*

Will the "*Pall Mall Gazette*," apply the directions given and tell the result?

Dr. Carpenter having referred, in his second essay, to the well-known errors in the Census of Quebec and Montreal, wrote : " It is hard to place any reliance on returns of places of less importance, least of all on country districts." On page 3 : " The returns may be regarded (subject to exceptions) as sufficiently correct to show the *comparative* mortalities of cities and adjacent counties, and to compare these with the ratios worked out from the preceeding Census." And on page 8, " It is probable that these country returns are more accurate than those of the city." Why the change ? and how comes it, that returns which contain "manifest and gigantic untruths" of the two largest cities of British America are good for anything ?

Because a greater number of deaths occur in Britain in winter than in summer, he says, " It would therefore be naturally expected that in the extreme cold of a Lower Canadian winter, the death-rate would rise proportionally, but it is not so." Would it not be natural to inquire, When do the greatest number of deaths occur in North America? Dr. Carpenter's expectations are based on the exceptional condition of Britain, and it will show the limited range of his reading and thought on the subject to quote from a popular magazine, " In Britain, deaths are fewest in the summer quarter or hot season; when the mean temperature is highest; and most numerous in the winter or coldest quarter. In these respects, Britain differs from other countries, where the summer heats increase the mortality, and even in this country, when the summer heats are above the average, as in 1857, an increased mortality occurs, especially if the weather be dry, giving rise to severe bowel com-

* Companion to the Almanac 1844.

plaints, as dysentery, diarrhœa, cholera, &c." (Chambers' Information for the People. Article ; Social Statistics).

On page 18, (second essay) on the authority of the census, *regarding which on page 2, he says, " it is hard to place any reliance,"* he states that the deaths in the first year of being are nearly twice as great as in Liverpool. In an article which appeared in the *Witness* reprinted in the *Daily News* of 15th September, the numbers living at certain specified ages in Montreal, London, Glasgow and Manchester, are compared. It is also stated, on the authority of the register of baptisms, that the number living in Montreal under one year, must have been 808, more than the number enumerated in the Census. Still, the Census gave 15196 as the number living in Montreal under 5 years, against 10746, or one-half more than the number living in London, in the same number of inhabitants. Supposing the children to have been equally healthy, the deaths in Montreal must have been one-half more than the deaths in London. In another table which appeared in the same papers, the rate of mortality which prevailed in London in the 4 years, ending with 1841, is applied to the numbers living at the specified ages in Montreal, in 1861, and it is thus shown, that the deaths at the London rate would have exceeded the total deaths in Montreal.

Dr. Carpenter's third essay is entitled, " On some of the causes of the excessive mortality of young children in the city of Montreal." On page 19, of the second essay, there is an extract from the Sanitary Report, presented to the Imperial Parliament in 1858, in which it is stated that " The lives of young children furnish a *very sensitive test of sanitary circumstances.* That those places where infants are most apt to die, are necessarily the places where survivors are most apt to be sickly; and where if they struggle through a scrofulous childhood to realize an abortive puberty, *they beget a sicklier brood than themselves.* A high local mortality of children, must almost necessarily denote a *high local prevalence of those causes which determine a degeneration of race.*" Then Dr. Carpenter adds, " These words are prompted by long experience **** how awful must be their truth in this city where the rate is *the highest yet presented.*" In the report of the Montreal Sanitary Association for 1867, it is said, " The unhealthy influences which kill children, *sicken the adults.*" If the reader can be surprised by anything, he will be by Dr. Carpenter's declaration in the third essay. Having presented what he calls an "analysis of children's deaths in Montreal for the year 1867," he says, " It is evident, therefore, that the children from 5 years upward are remarkably healthy in this city." What about sickening the adults; the sicklier brood ; and degeneration of race ? Dr. Carpenter seems to have studied the Prophecies of Isaiah, with the same unprofitable result as his study of social statistics; refer to his first essay, and also to table 21 in the third. In the latter he says, that Isaiah

prophecied, that in Montreal, there would be no deaths of children under 12 years of age in the year 1867. The prophecy does not refer to the present time, for the Word errs not. He should have consulted Job, who asks, " Who can bring a clean thing out of an unclean ?"

In the articles which appeared in the *Witness*, it is stated, " *That the birth-rate is the certain controlling element of the death-rate ; That whereever the ratio of births to population is the highest, there also the mortality is greatest ; and things being equal, will be in proportion to the birth-rate.*

The following table, constructed from the returns of the English Registrar-General, is submitted in proof of the proposition. If the registration had been complete, the estimated would have been more nearly in accordance with the actual rates.

TABLE IV.

Showing the average number of Births and deaths, registered in England, to 100,000 females living, according to the mean of the 3 years ending 30th June, 1841.

5.655 per cent of Births in the South-Eastern Division gave 1.809 per cent of Deaths, therefore 6.837 per cent of Births in York should have given 2.187 per cent of deaths, &c.

DIVISIONS.	Rate per cent of Births.	Actual Rate per cent of Deaths.	Proportionate Rate per cent of Deaths.	Relative health of Divisions. Difference of Deaths from proportionate rate.	
				Above.	Under.
Metropolitan (London)........	5.553	2.339	1.776	.563	
do do †........	5.553	2.339	1.612	.727	
South Eastern, purely agricultural	5.655	1.809	Standard	of Com parison.	
South Western......	5.690	1.799	1.820	....	.021
Eastern......................	5 867	1.981	1.869	.112	
Welsh	5.869	1.935	1.877	·058	
South Midland...............	6.286	2.061	2.011	.050	
Western	6.315	2.074	2.020	.054	
Northern....................	6.447	2.042	2.062	....	.020
North Midland...............	6.486	2.123	2.075	.048	
York........................	6.837	2.222	2.187	.035	
North Western*.............	7.095	2.670	2.270	.400	
ENGLAND...............	6.220	2.113	1.990	.123	

This table shows that under an imperfect registration, without regarding the nature of the locality or the prevalence of different kinds of disease; an estimate of the number of deaths, based on the standard of a purely agricultural division, would err by only 123 on a population of 100,000 of all England. Excluding the Metropolis and the North Western Division, which may be called a city, the difference in the number of deaths among a population of 100,000 ranges from 21 under, to 112 above the

* Scarlatina was epidemic in Lancashire in 1840, and during the three years caused 26,640 deaths in England; of which the North Western division returned 5205 or nearly one-fifth. This division includes Manchester, Liverpool, Preston, and 15 other towns, whose population was over 5000, more than half of the population was living in these towns.

† Corrected for an increase by immigration of 7·9 per cent in 10 years. Ages of immigrants not taken into account.

calculated number; and shows an average of only 37 above the estimate. If the South Eastern and North Western Divisions were not affected by the migration of the people, and if London gained by immigration the same proportion of population in the above years, as in the 10 years included in the Census of 1861; and without taking into account the greater value of the lives of the immigrants, (an element in the calculation which may be balanced by the greater number of births among the immigrants) then the number of deaths in London was greater than the number in the South Eastern and North Western Divisions, and all England, by 727, 327 and 604 in each 100, 000 of the population. Dr. Letheby in his annual report for the year 1859, for the City of London, says that the death-rate was below the average and only 1 per 1000 higher than all England. But no allowance is made for the low birth-rate and immigration. The above table shows that the deaths in the Metropolis were in excess of all England by 6 per 1000. If a change has taken place in the seeming rate of mortality, it will have been caused, chiefly, by a decline in the birth rate, and an increase of immigrants.

If the birth rate gives the death rate for the whole of life, it must give the rate for any part of it.

Let us test the proposition, by the facts recorded in Montreal where the deaths of children are said to be fearfully excessive. Dr. Letheby, in his report for 1859, says: "The mortality of children in the first year of their age, has been very severe, for it has amounted to nearly one fifth of all the births; in fact, out of 3,260 children born in the year, 608 have died. This is somewhat more than the average (3,504 and 574) for the last 10 years. **** Dark, however, as this picture may seem to be, it is far lighter than it once was, and is brighter than that which is still drawn of the chief towns of England* and the large cities of Europe." From the report it appears that *the birth-rate is only about* 2·5 *per cent.*, so that the deaths are few, not because the people are so very healthy, and the city so very clean, but because the births are few. The writer has not all the figures necessary to make a correct estimate, but the following are sufficient to illustrate the principle. In the Metropolis in the 3 years ending with June, 1841, the birth-rate was 2·966 per cent., to an equal number of males and females. Dr. Letheby shows that the death-rate in the first year, on an average of 10 years, was 16·381 per cent. *of the births.* The number of births in Montreal is not known, *but the baptisms* during 14 years were 4·882 per cent. No deduction will be made for the large number of illegitimate children sent to the city (about one-fifth per cent. of the population) *who though baptised are of very little value, in this estimate, compared with legitimate children.* If in London

* See table IV and page 29.

2·966 per cent. of births gave 16·381 per cent. of that number of deaths in the 1st year ; 4·882 per cent. of baptisms in Montreal, should give 26·963 per cent. of deaths. Observe that the rate for Montreal is less than it should be, and that the lessened rate of mortality is applied to the smaller number : the baptisms.

The baptisms for the year ending 4th July, 1858,
  (average of 1857 and 1858) were 3801
In 1863–66, 4 years 21175

Number of baptisms in 5 years 24976

The deaths In the first year at 26·963 per cent
  on 24976 would be 6734
According to M. Quetelet, 1 tenth of all the
  children born alive in Belgium (town and coun-
  try) die within one month. *Suppose all the
  Catholic children in Montreal, to have been bapti-
  sed,* In 1861 the Protestants were 27·5 per cent of
  the population, but the registration of baptisms
  for 11 years, (1858–1868) shows that they
  recorded only about 20 per cent. of the whole
  number.* The number of Protestant children
  baptised in above years was, say 4995. The
  average age at baptism is about 3 months. But
  add to estimate of deaths only $\frac{1}{2}$ of the baptisms
  ($\frac{1}{9}$th of the births), as the number of Protestant
  children born alive appearing in the list of
  interred and not in the register of baptisms 624

The proportionate number of deaths in Montreal of
  infants under 12 months, according to the
  London rate would be 7358
  or 29·460 per cent. on baptisms, representing a
  birth-rate of 5·334 per cent. of children born alive.
The burials of still-born children and infants un-
  der 1 year, in the above years were 8208
The total burials were in 1858 (average of 1857
  and 1858) 2500
In 1863–1866 15942

Total burials in 5 years 18442

The average number of still-born, interred in the
  Protestant Cemetery, has been shown to be 7·866
  per cent. on the burials, and this is certainly
  below the average for the whole city.
Deduct from burials the still-born at above rate 1452

The deaths in Montreal in 5 years, when the total
  mortality was ·03 per cent. above the average of
  14 years, was only 27 per cent. on baptisms, or 6756
Being less than the proportionate average of the
  Metropolis by 602
  or 120 per annum, therefore it is that the
  children from 5 years upwards are remarkably
  healthy.

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* See note page 35.

The above years it will be noticed include the very unhealthy year 1864. Dr. Carpenter on page 17, of second essay, says the death rate in the first year of life, on the average of 12 years was 43·41 per cent. on the living. In the third essay, page 10, he says the rate in 1867 was 39·99 and on pages 17 and 18, that it was 36·8 per cent. Which is the correct rate? And how comes it that while in the 12 years, the deaths under 1 year were 43·41 per cent. of the living at that age, and the deaths under 12 years only 2·5 per cent. on all the living; that in 1867, when the deaths under 1 year, were only 36·8 per cent., that the deaths under 12 years, should have increased to 2·73 per cent.: when the children from 5 years upward were remarkably healthy?

The English Registrar-General's returns (Table 4) and the comparison of Montreal with London, demonstrate that in the ordinary course of nature, an increase in the birth rate is accompanied by exactly the same rate of increase in the death rate, so that *if the inqury be limited to the first year of life*, an increase of 100 per cent. of births will give an increase of 400 per cent. of deaths. The following table is constructed on the rates observed in London.

TABLE V.

Table showing the approximate proportionate rate per cent. of deaths in the first year of life, and on the whole population according to the London averages. It is presumed that, to the whole population the births were 2·954, and the deaths 2·676 per cent.: The increase by immigration was 73·8 per cent. of the birth-rate of increase in the 10 years ending in 1861.

"In London in 1861 more than one-half of the resident population were born elsewhere." Census of the British Empire by C. A. Coke, page 76.

Birth-rate per cent.	Death-rate per cent. in 1st year of life.	Death-rate per cent. to population.
1	5·545	0·906
2	11·091	1·811
3	16·636	2·717
4	22·181	3·623
5	27·726	4·528
6	33·272	5·434

This law of nature shows, that the rate of mortality of different places cannot be compared, unless the birth-rate is taken as the standard. Many children die within a few hours of birth, so that no Census ever can exhibit the same number living under one year, as were born during the year. It is customary to compare the number of deaths under five years, and one year, why not under one month, and why not with the number born? Endless discussions have, in consequence, arisen regarding the health of different

cities; of course, the cities having the lowest birth-rate, almost invariably, had the best of the argument. For instance, the Registrar-General of Scotland, in his report of the eight principal towns for 1859. which was an unusually healthy year, having given the number of deaths under five years, says; "Let Edinburgh and Glasgow be taken as examples. The births in Glasgow are in proportion to the total population, nearly an exact fourth (he should have said one third) higher than in Edinburgh. Supposing then, that it were even granted, that the infantile deaths in Glasgow should be a fourth (third) greater in consequence of this excess, which is a most extravagant supposition, this would fail to account for the fact that the infantile deaths there are almost the double of the Edinburgh rate, &c., &c." The birth-rate in Glasgow, was 410, and in Edinburgh 301 to each 10000 of the population. According to table 5, the deaths in the first year should have been, in Glasgow 93, and in Edinburgh 50, to each 10,000, *or nearly double, which the Registrar said it should not be.* The total deaths to the 10000 in Edinburgh were 203. If 301 births gave 203 deaths, then 410 births in Glasgow should have given 276·5 deaths. The deaths were 278. so that the cities were equally healthy.

In the *Glasgow Herald* of 9th January, 1867, there is a letter from the late Lord Provost, of Glasgow, Mr. John Blackie, Jun., in which "the sacrifice of life" is used as an argument for entering into certain extensive, and doubtless much needed improvements in the city. A note from the Registrar General of England, Major George Graham, is quoted, showing that the average rate of mortality in 1865 and 1866, was in London 2·545, in Edinburgh 2·773, and in Glasgow 3·123 per cent.; but there is nothing said as to the birth-rate and the proportionate number alive at different ages. Table 5 shows, that the birth-rate in London should have been 2·80 per cent. If the births in Edinburgh were 3·01 per cent., then its rate of mortality was above the table rate, by ·05 per cent., but this apparent excess is probably more than balanced by the loss by emigration, as the City is not increasing at the rate of births over deaths. According to the City Chamberlain of Glasgow, Mr. West Watson, the birth-rate in the above years was 4·17 per cent.; and the increase by immigration for many years, nearly equal to that gained by natural increase. The death-rate for Glasgow is (table 5) .... 3·777

But Glasgow gained by immigration about 14·5 per cent. on its increase by births more than London, which must be deducted from the apparent rate, or say .... ·547

	3·230
The rate in Glasgow was	3·123

Glasgow rate of mortality, less than London rate by ..... ·107

Mr. Blackie says that, in one of the districts of Glasgow, Blythswood, the average length of life is 50 years; and in another Anderston, only 38 years. The statistics are not given, but from the City Chamberlain's reports for the three years 1855-1857, The average birth and death-rates for the districts were respectively 2·742, 1·774 and 4·915, 2·885. The proportionate death-rate for Anderston was therefore 3·179; according to the proportion between births and deaths in Blythswood, so that Anderston was more healthy than Blythswood by ·294 per cent. In these years the rates for the whole city were, births 3·953, deaths 2·841 per cent. The total mortality was therefore only ·233 over the ratio of Blythswood.

Mr. Blackie, in writing of the average length of life, has made a mistake which if at variance with the argument would not be worthy of notice, but it is no mere slip. He thinks that the rate of mortality expresses the average duration of life; which it would do were the births and deaths equal, but the average is much less in a community which is increasing rapidly by births. The mean term of life must be about 37 years in Blythswood, 21 in Anderston, 26 in Glasgow, and 33 in England. It is longest in Blythswood simply because that district has the lowest birth-rate. The average length of life must be short, and of course, the rate of mortality must be high, in a rapidly increasing population, but so long as the rates are not relatively higher than the average, the population must be healthy and vigourous.

The fallacy of estimating the health of a people by the rate of mortality; without comparing it with the birth rate, is clearly shown in Porter's Progress of the Nation (Edition, 1851 page 18.) Having stated that the population of the United Kingdom and France had increased from a lessened death-rate, and not from an increase in the birth-rate; which had in fact declined; it is said "In France, the births, which in 1817, were in the proportion of 1 in 31, were in 1834, in the proportion of 1 in 33·66; while the deaths, which, in 1817, were 1 in 39·125; were diminished in 1834 to 1 in 41." The mortality in 1834 should have been only 1 in 42·489 according to the relative proportion of 1817, so that, the death-rate had largely increased. Had the French continued to move in the same direction and at the same ratio, they would have become extinct in a few generations. In the article on "Population" from which the above is an extract, it is argued that because, according to the Bills of Mortality of London; the deaths under 20 years, in proportion to the total deaths, gradually declined during the sixty years ending in 1821, that therefore; the people lived longer. According to the Census, the rate of mortality in England, in 1811, 1821 and 1831, was 1 in 54; 1 in 61 and 1 in 59. The evidence

given before the Committee of the House of Commons in May, 1830, confirmed these rates. The imperfect registration of the years 1837-1842, gave an average of 1 death in 46, so that, it is not likely, that the Census returns were correctly made. But the Parish Registers in England are not more reliable that the Clergy returns in Montreal. " The annual mortality of the county of Middlesex; the largest proportion of whose population belongs to the Metropolis, was, according to the Parish registers " only 1 in 53 in 1840: but the Civil register shows that it was 1 in 42. (Porter's Progress page 27.) Is it surprising, that it has been said that everything is true, but facts and figures ?

The conflicting evidence of the Census and Parish registers suggests the question. On what authority is the following statement made? " It has been proved that the population of some of the States of North America has, after making the most ample deduction on account of immigrants, continued to double for a century, in so short a period as twenty, or, at most, five and twenty years,&c." (McCulloch on Population in Smith's Wealth of Nations: Senior's " Political Economy," &c., &c.) Such a rate of progression would require an increase of 3 per cent. per annum, and a birth-rate, three times greater than that of the United Kingdom.

On page 13 of Dr. Carpenter's third essay it is stated that, in Boston in 1867 " the yearly rate of deaths among 5500 children under 1 year " was 23·3 per cent. If such was the case, then Boston should have had a birth-rate of 4·22 per cent. else the death-rate of infants was greatly in excess of the proportionate rate in Montreal and even of that of London, If Boston had so high a birth-rate, exceeding that of Glasgow, its character has hitherto been very much misrepresented.

In Dr. Carpenter's essays the still-born are included among the deaths, so that no comparison can be made with returns in which the *deaths are calculated on the number living*. On page 13 it is said " that of the total deaths in the year only 24 per cent. in Boston were under one year, instead of 46 per cent. in Montreal." The statement regarding Montreal is entirely wrong. (See his table on page 10, where it is stated that 201 still-born are included.) Deducting the number of still-born, the deaths are less than 42 per cent. of the *burials*, and only 43·6 *per cent. of the deaths*. In Montreal, the Catholics do not return the number of still-born, and as the rate used in this article is the average of 6 years among the Protestant population, there can be no doubt but that, in 1867, when the mortality was above the average, the number of still-born was at least 7·866 per cent. on the burials, or 351 instead of 201. If such was the case, then the deaths of infants

under 1 year, in Montreal, in 1867 were only 38 per cent. of the burials, instead of 46 per cent. as represented by Dr. Carpenter. The estimated population of Boston in 1867 was 196000, of whom only 5500 were under 1 year. The proportionate number in Montreal, according to the Census, supposing it to have had the same population as Boston, would be 8029, and if the Census were corrected, according to the register of baptisms, the number would be 9780. The deaths of children in Montreal, in proportion to the total deaths, must therefore be greater, simply because there is a much larger proportionate number of children living. The annual mortality of children under 1 year in Boston is given as 23·3 per cent. on page 13, and as 17·4 per cent. on page 17 and 18. Dr. Carpenter must have made a great mistake in the statistics of Boston, furnished him by the Registrar of that city, because it is not possible, that with an average population of 178500, Boston interred only 2474 of her citizens per annum, on the average of 10 years. The figures are not misprinted, for he states the rate on the present population to be in accordance with these figures. What has the average rate of the previous 10 years got to do with the present population ? The rate of mortality in Montreal; during the previous 10 years, on the present population, is not stated, an omission, thoroughly in keeping with the spirit which induced him to write in 1867 that, " in the cholera year, the deaths (in July) rose from 33 to 281 ; which last, *if continued*, (italics by the writer,) would have added 195 per 1000 to the death-rate of the city, a mortality which only admits of parallel with the plague years of London before the fire."

Dr. Carpenter says the births among the Baptists are not publicly registered. Again he is wrong.

It has been shown that the death-rate of children under 1 year, in Montreal, is less than in London, so that, Dr. Carpenter, who has said that the mortality of young children is frightful, has great difficulty in finding out the cause. It is not drinking, for he says " Montreal is not an unusually drunken city." It is not the milk, for " it is probably better and cheaper than in most English cities " and he says " There is no reason to think that the Montreal mothers are less careful than in the country round." But he says, " Every thoughtful person who has observed and studied the simplest facts and first principles in sanitary science, must be aware that a *sufficient cause* for all our deaths is to be found in the filth and pollutions which are allowed to remain in our midst, &c. * * * * * * Our sewer and house drain system may be called (with few exceptions) an express contrivance for conveying the ordinary air poisons, and the extraordinary infections of small pox, scarlatina, &c., into every part of the city, and espe-

cially from the low into the higher levels, lest the rich should selfishly conclude that they were not affected by the evils which they allow to scourge the poor." Therefore the deaths from epidemic and infectious (Zymotic) diseases in Montreal must be extremely numerous, seeing that it has been expressly contrived to carry the cause into every part of the city, and that, *that cause alone is sufficient to account for all our deaths.* In the second essay it is stated, that the deaths from Zymotic disease were in Upper Canada, 19 per cent., in all England 22, in Lower Canada 25, in 7 Counties round Montreal 27, and in *Montreal only* 25·5 *per cent. of the total deaths.* But this is not all, the proportion in Montreal should be very largely increased, even though it be granted that Dr. Carpenter did not mean what he wrote, because the city is contrasted with the Country, and the proportionate rate should have increased with the increased mortality ; in the same way that the deaths of children formed a large proportion of the whole deaths. The story that the deaths of children were excessive, *seemed* to be true, but the story about the drainage has not even the colour. Need it be wondered then, that the Sanitary Association has a few opponents, as the President says it has, when the Citizens are assured that Dr. Carpenter's figures and data cannot be disproved ; and on the authority of their own common sense they know that his conclusions are the very opposite of those that should be drawn.

In 1867 Dr. Carpenter claimed that the Sanitary Association, (which was formed in the Spring of 1866,) saved the lives of 470 children in the previous year, and in 1869 he increases the claim to 550 on the average of some years before and after 1866. In 1869 a very different account is given. He says " It should be remembered that in each of the years, beginning with 1866, the official directors and executors of public hygiene have stated that the city was never before in so cleanly a condition, yet the death-rate has risen even above the previous number." Table 7 shows that the rate of mortality in 1867 and 1868 was higher than in any year since 1855, (the first embraced in the table) excepting 1864, and that *the average of the two years exceeds the average of the 9 years previous to* 1864 *by* 0·42 *per cent.* How comes it that the " partial surface cleansing," which produced " a marvelous benefit " in 1866, failed in the next two years ? The claim on behalf of the Association is taken for granted, but until proved it cannot be allowed.

It will now be shown that the operation of ordinary causes accounts for the low death rate in 1866.

From the writer's table I, it appears that in 1863 the baptisms were at the rate of 5·40 per cent., the highest during the 14 years ending with 1868, and fully one half per cent. above the

average. The births in 1864 were under the average. Scarlatina prevailed during that year, and the number of deaths of children under 12 years, which in 1863 was 2535, was 3536 in 1864. In 1865 the birth-rate was still above the average, and the deaths of children under 12 years, 2864, were also far above the average, so that, the year 1866 opened with the ranks of the one, two and three years' old children sadly thinned. During the year the baptisms fell to 4·45 per cent., the lowest rate then recorded ; and were 385 less than in 1865, therefore it was, that the total deaths in 1866 were 415 less than in 1865, and the rate of mortality *apparently the lowest* in fourteen years.

Again, in the 10 years 1855-1864 the average birth-rate was 5·07 and the death-rate 3·58 per cent. : therefore the birth-rate of 1866 : 4·45, should have given a death-rate of 3·14 per cent. ; the rate was 3·11, or only ·03 per cent. less than the average of 10 years, *which on Dr. Carpenter's estimated population amounts to only 34 lives. But it must also be remembered that, in* 1866 *the number of illegitimate children sent to the city was less than the average, and* 110 *less than in* 1865, *and as he says that* 89·9 *per cent. of such children die within the year, the deaths in* 1866 *should have been less than in* 1865 *from this cause alone by* 99

The deaths were less than the average of 10 *years by* 34

So that, the deaths in 1866 *exceeded the average number of the* 10 *years by* 65

The above will suffice, until the claim is made out in proper form.

Presuming that the Clergymen who have not sent in their returns for 1868, have registered as many baptisms as in 1867, then the three years 1866-1868, show an average birth-rate of 4·47 per cent. and therefore the rate of mortality, according to the average of 10 years, 1855-1864, *should have been* 3·16 *per cent. ; it was* 3·52, *or* 0·36 *per cent. higher, which, on the population estimated by Dr. Carpenter, amounts to* 420 *deaths per annum, above the average of the* 10 *years, ending with* 1864.

An examination of the writer's table I, shows a steady decline in the birth-rate from 5·07 per cent. during the 10 years beginning with 1855, to 4·47, in the 3 years ending with 1868, accompanied with an actual increase in the rate of mortality from 3·16 to 3·52 per cent.; although there is an *apparent* decline from 3·58 to 3·52 per cent. If the population has continued to increase at the estimated ratio, the lessened birth-rate must have been compensated by an increased rate of immigration, in that case, the increased rate of mortality is even greater than it seems. Supposing the addition to the population by immigration to have been very much larger than

calculated, and that thus a number of deaths were recorded while the increased number of immigrants has not been added to the population, this cause would not account for the increased mortality, for it has been shown, that the addition of 20000 immigrants over the usual number; of an average town population; 20 years of age, would add only 130 deaths in that year.

It is very likely true, that the inhabitants of the suburbs, outside of the city limits, are now using the city burial grounds in an increased proportion, and that the illegitimate children† sent to the city has also increased by more than a proportionate number, so that the increased mortality may be only apparent.

On the other hand, the greatly increased cost of living, arising from the extraordinary advance in house rents, &c., has doubtless resulted in over crowding among the poorer classes, and helps to explain why the marriage rate, which in the 7 years beginning with 1855 was 1 in 93, declined to 1 in 101 during the next 7 years. The number of young persons now employed in factories is also much greater than it was fourteen years ago, so that it is likely, that an actual increase in the rate of mortality has taken place.

After all, it has been shown that Montreal is more healthy than Glasgow and London, and much more healthy than Manchester; and that the deaths of children in the first year of life, in Montreal, are not only, not excessive, but actually less, in proportion to the number of births, than in London.

A very imperfect sketch has now been given of the unfounded statements and erroneous views circulated by the Sanitary Association, and the reader must judge of what effect they have had on the general prosperity of the city. But, of the Secretary it must be said, once for all, on behalf of men who are labouring in a most uninviting field of thought; in which the work is hard and the fruit is little, that he has no place in the wide domain of Statistical Science.

EXPERIENCE.

Montreal, September, 1869.

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† As nearly all, the illegitimate children sent to the city are taken to the Grey Nunnery and baptised; the Roman Catholic portion of the population is made to appear more prolific than it is; but as comparatively few survive the first year, their deaths increase in a very much greater degree the apparant rate of mortality.

OPINIONS OF THE PRESS.

Montreal is greatly obliged to the gentleman who has furnished us with a series of statistical articles. * * * * * In these articles he shows the fallacy which has hitherto led us astray; namely, comparing the mortality of a city where the birth-rate is high with other cities where it is low. * * * * * To make this plain, let us suppose that in London there are 30 children under one year to every 1000 of the community, whilst in Montreal there are 60. Take then, again, *for example*, the death-rate in each case of the infants under one year at 16 per cent. and of all the rest at 2 per cent. and we have:—

LONDON.			MONTREAL.		
970 at 2 per cent	....	19.4	940 at 2 per cent	....	18.8
30 at 16 "	....	4.8	60 at 16 "	....	9.6
1000		24.2	1000		28.4

The whole mortality is thus increased from a little more than 24 persons per 1000 to 28 per 1000, though the sanitary state in the two places, both as to infants and adults, and the percentage of death in both classes, is precisely the same! But great as is this difference, that of the infant mortality is very much greater,—the one being 0.48 while the other is 0.96 per cent. of the population, or exactly double; and yet, as before stated, the healthiness of both places is precisely equal.—*Witness*, *24th Aug.*

The article will be read in England with a degree of interest little inferior to what it will excite here. For the present, we merely call attention to the subject, and hope that our contemporaries, who have had so much to say about the fearfully high rate of infant mortality in Montreal, will give an equal amount of publicity to the views of our correspondent.—*Daily News, 25th Oct.*

We draw the attention of the Sanitary Association and Dr. Carpenter, to an article which appeared yesterday on the fourth page of the *Daily News*, and which refutes, in the most crushing manner, several of the statements advanced by that learned statician.—*Nouveau Monde, 26th Oct.*

We find in one of the late numbers of the *Daily News*, an important anonymous article, but which is, nevertheless, carefully digested, upon the subject of the sanitary condition of the city. It is a refutation of the last report of Dr. Carpenter, whose figures and statistics it shows to be false by means of official proof. We do not wish to mix ourselves up with this discussion, further than to point out to Dr. Carpenter the necessity there is for him to explain himself, and to advise the Corporation to do nothing before the question shall have been settled.—*L'Ordre, 28th Oct.*

VITAL STATISTICS.—The deductions from the mortality returns of the city of Montreal drawn by Dr. Carpenter, have led to a somewhat important contribution to the discussion of this important subject. The writer is a gentleman who from his knowledge of figures and the attention he has given for some years to the consideration of the laws which regulate the growth of the population is entitled to be heard with respect and his statements carefully examined. * * * * * * He shows that Montreal, instead of being the "plague spot" described by Dr. Carpenter, in reality enjoys fully more than an average exemption from infant mortality. * * * Other tables show, according to the writer's figures, that Montreal is more healthy than London and Glasgow, and much more healthy than Manchester. Should these statements be correct, and from the very cursory examination we have yet been able to make of them, it seems difficult to disprove them, it is of the utmost importance they should be known, so as to remove the charge always brought against Montreal in this respect.—*Herald, 28th October.*

THE SANITARY ASSOCIATION.— * * * It is quite impossible to convey even a faint idea of the complete destruction of the whole of the arguments of Dr. Carpenter. The castle in the air has vanished. The Sanitary Association, like a class of beggars who extort money by exhibiting their sores, delighted in representing Montreal as a polluted Queen, swollen with drink and debauchery, and covered with all manner of filth. But "Experience" has torn away the rags with which Dr. Carpenter had clothed her, and she steps forth glowing with health, young and

" Beautiful as Ruth among the corn,
    Or Rebekah by the stoney well."

Star, 28th October.

The writer of the paper signed "*Experience*," which we published some days ago showed how grossly wrong were the figures on which Dr. Carpenter relied in those papers of his, which attracted very much attention, and which described our fair city as an exceedingly murderous place for infants—one of the most destructive places, in fact, under the sun. It is satisfactory to find that it is not so bad as represented, in fact, not worse but better, than many other places.—*Gazette, 8th Nov.*